ATOMIC ENERGY letter

THE FIRST AND ONLY

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Dear Sir:

A suggestion was made by David E. Lilienthal last week that the United States put President Eisenhower's atomic energy plan among Western nations into effect immediately, while continuing negotiations for participation by the Soviet Union. Mr. Lilienthal, former Chairman of the USAEC, and presently chairman of the board of Attapulgus Minerals & Chemical Corp., spoke from a New York studio of the National Broadcasting Co. (The Eisenhower plan referred to was that the United Nations create a stock of normal and fissionable materials to be used for the purpose of peace, not war; the stockpile was to be accumulated by contributions from all powers.) Mr. Lilienthal recalled that the Soviet answer to the President's proposal expressed a readiness to negotiate, but attached the proviso that the negotiations be private, and listed other conditions. These conditions, he noted, "have a most familiar sound to all who remember the Soviet's success in dealing out death-by-negotiation to Bernard Baruch's epic efforts to end the atomic arms race". "I believe that an immediate start is essential for two reasons", he explained, "first, as a demonstration to the whole world of the complete good faith with which the proposal was made; second, to prevent the proposal being killed through the necessary or deliberate delays of protracted and complex discussions with the Russians".

Considering the details of the plan, Mr. Lilienthal said he saw no insoluble problems in materials or manpower. As to materials, he said that the United States and Great Britain, both of which have stocks of uranium and plutonium, have already said they favor contributing at least a beginning toward the proposed international atomic pool. Canada, and Belgium too, he stated, have uranium, as does Australia. He noted that Brazil and India have thorium. Furthermore, he pointed out, Norway, Holland, Canada and France, as well as the United States and Britain, have a supply of radioactive materials for research purposes, some of which they could contribute to the pool at once, if they wished. Scientists could come from many countries he stated, while Geneva, Switzerland would be a readily accessible location for the proposed agency.

President Eisenhower told a press conference in Washington last week that the Atomic Energy Act (1946) of the United States, which strictly limits the Government's freedom to exchange atomic information, weapons, or materials with other countries, was obsolete. (While he did not elaborate on the extent of liberalization he desired, it is believed that he will ask Congress not to stipulate what kinds of materials, information, and weapons can be exchanged. Instead, he will request wider authority for the President, with the guidance of his advisors, to decide what should or should not be exchanged. Other amendments, as previously noted in this LETTER, would liberalize the patent system governing atomic development, and enable private industry to own or rent fissionable materials and to build and operate nuclear reactors.)

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BUSINESS NEWS...in the nuclear field...

NEW DIVISIONS CREATED BY FIRM ACTIVE IN NUCLEAR FIELD- A plan of merger and reorganization of the Vitro Manufacturing Company is now to be put into effect, following ratification of the plan by shareholders last week at a special meeting in Pittsburgh, Pa. The parent corporation and its two subsidiaries, Vitro Corporation of America, and Vitro Chemical Company, will merge into one corporation. The merged corporation will be known as Vitro Corporation of America, with offices in New York, and will include five divisions or operating units. It will retain the same capital structure, directors, and officers. The resulting divisions of the corporation will be Vitro Manufacturing Co., Pittsburgh, Pa., makers of ceramic colors and chemical products; Vitro Uranium Co., Salt Lake City, Utah, processors of uranium ore; Canonsburg Rare Metals Co., Canonsburg, Pa., engaged in the refining and recovery of metals; Vitro Laboratories, Silver Spring, Md., and West Orange, N. J., engaged in research and development; and Vitro Engineering Div., New York, N. Y., providing engineering, design, and construction management services. The merger of the corporations simplifies a structure which had grown to its present status through acquisition. (As an example of this process of acquisition, the engineering division, in New York, was the former Kellex organization, World War II offshoot of M. W. Kellogg, which did pioneering work at Oak Ridge. This was acquired by the shareholders from the Pullman Company, after Pullman had purchased M. W. Kellogg.) J. Carleton Ward, Jr., president of Vitro Corp., said that except for the change of name, the interests of Vitro shareholders will not otherwise be affected, and each shareholders will retain in an equivalent form the interest he previously held.

NUCLEAR POWER STUDY TO BE MADE BY TENNESSEE VALLEY AUTHORITY- An agreement has now been made between the USAEC and TVA under which TVA will make a study, similar to those underway by private industrial groups, of various economic and technical aspects of nuclear power production. TVA, one of the largest single power producers in the U.S. will conduct a study aimed at reaching conclusions as to the immediate and long-range possibilities of commercial nuclear power. (TVA presently supplies a major portion of power for USAEC facilities at Oak Ridge, Tenn., and Paducah, Ky.) All costs of the study, which will be for one year, will be borne by TVA. Upon conclusion of the study, reports and recommendations will be made to the USAEC. Title to inventions and discoveries, and disposition of reports made in the course of the study, will be determined by the USAEC.

NEW RADIATION LABORATORY BEING BUILT- A special radiation laboratory, for diversified experiments in the industrial use of radioactivity, is now to be constructed by General Electric Co., at Schenectady, N. Y. The facility, which will be a part of G-E's general engineering laboratory, will occupy a former factory building in a fringe area of the plant. Conversion of the building, at a cost of some $500,000 is now underway. The special lab will be equipped for various kinds of high-energy radiation experiments, since studies are expected to range from work with radioactive tracers to the use of particle accelerators. Examples of the work which will be done, according to Dr. G. Wesley Dunlap, manager of the parent laboratory's instrument and nuclear radiation department, include the use of radiation for non-destructive testing applications; the use of radioactivty to measure wear on bearing surfaces; the calibration of radiation detection instruments; etc. Heavy shielding and concrete cubicles will provide radiation protection.

PERSONNEL CHANGES MADE BY MAJOR USAEC CONTRACTOR. New manager of production for Carbide and Carbon Chemicals Co., at Oak Ridge, Tenn., and Paducah, Ky., will be Logan B. Emlet, who will succeed to this post Jan. 1st, 1954, according to J. G. Davidson of that firm. Dr. Davidson is president of Carbide and Carbon Chemicals Co., the division of Union Carbide & Carbon which operates these facilities as prime contractor to the USAEC. Mr. Emlet replaces W.B. Humes, who has been appointed manager of operations of Union Carbide Canada, Ltd., with headquarters in Toronto.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear lab & plant...

FROM THE MANUFACTURERS- New safety pipette filler, which can eliminate mouth pipetting, is recommended for transferring radioactive solutions, as well as corrosive, toxic, infectious, and ill-smelling liquids. This instrument, operating on the principle of accurately controlled suction, is said to enable measurement precision of 0.01-cc. Trade-named "Propipette", the safety pipette filler has three agate-ball valves which operate independently, with the entire procedure controllable using one hand. A feature of the Propipette is that the liquid can be held at the set level indefinitely so that the procedure of pipetting can be interrupted. --Instrumentation Associates, 138 Haven Ave., New York 33, N. Y.

An inexpensive air sampler, for use with nearly any radioactivity laboratory vacuum system or small vacuum pump, is now available. Known as Model BI-101, the air sampler consists of a stainless steel filter holder, a vacuum gauge, and vacuum hose attachment. The holder is designed to take 22-mm. diameter filter paper, which later can be mounted directly on a standard planchet (of this manufacturer) for counting. The filter paper is supported by a 16 x 16 mesh stainless steel wire, allowing an active 3/4" D filter area. A vacuum reading of 16" of mercury on the gauge indicates a flow rate of 4 standard cubic feet per minute, using Hollingsworth & Vose filter paper of 0.009"-thickness. --Tracerlab, Inc., Boston 10, Mass.

M-toloxyacetic acid, a reagent for separating thorium from the rare earths of monazite sands and from uranium, is an organic chemical recently added by this producer to its list. (An abstract of the procedure for this chemical may be obtained at no charge.) --Distillation Products Industries, Rochester 3, N. Y.

NOTES: Experiments in the use of gamma rays to quicken and possibly simplify chemical reactions in the making of dyestuffs and other synthetic products from sugar, coal, oil, and other materials are planned for the early part of next year at Birmingham University, England, where a radiation unit is now in the course of construction. Radioactive by-products will at first be obtained from the Atomic Energy Research Establishment, Harwell.

A 15-ton overhead manipulator, or "mechanical arm", has been developed by General Electric Co., and is to be put into use in radioactive areas at G-E's Aircraft Nuclear Propulsion Department. (Work on nuclear propulsion of aircraft, by G-E, is being done by that firm under USAEC and U. S. Air Force contracts.) The new manipulator was built to supply lifting power several times that of existing "mechanical arms". Resembling a gun turret, the device operates from a crane bridge, with vertical maneuverability ranging from floor level to the height of the crane bridge. The heart of the control mechanism of the apparatus is a system of eight amplidynes, which provide automatic control giving smooth operation and limiting all motions to prevent damage to equipment.

A new fluorescence photometer, designed for uranium analysis, was described at a meeting last month of the American Physical Society, in Chicago, by F.J. Lynch, Argonne National Laboratory. The photometer has been used in studies for the reclamation of uranium from processing plant wastes, and also for the detection of uranium in minute quantities in biological material. In operation, fluorescence from a sample is compared with that from a standard fluorescent sample irradiated with ultraviolet light from the same mercury arc lamp source. Dichroic mirrors reflect the ultraviolet light onto the sample, and transmit the fluorescence to vacuum phototubes. Conventional photomultiplier tubes are not used. The circuit is so arranged that the 120 c.p.s. components of the photoelectric currents flowing in the two phototubes are automatically compared. The measurement is thus independent of the intensity of the exciting ultraviolet source. The Society also heard H. R. Crane, University of Michigan, who discussed improved Geiger counter operation through elimination of positive ion activation of the cathode. W. H. Burke, Jr., of Magnolia Petroleum, explained to the Society a time saving technique in making carbon-14 age determinations.

ATOMIC ENERGY DEVELOPMENT OUTSIDE THE UNITED STATES...a year-end review...

BELGIUM- It is expected that the Belgium reactor, which is at Moll, will be completed by 1954. The reactor uses natural uranium, is air-cooled, and uses graphite as the moderator; it is very similar to the Oak Ridge, Tenn., pile. Its power will be 2000 KW. In the design of this reactor, both American and British scientists have assisted.

CANADA- (Since a discussion of this nation's work appeared in the Dec. 15th, 1953 issue of this LETTER, it will not be covered here.)

FRANCE- It is proposed to build a pilot plant in the Rhone Valley to produce some 50-to 100-grams of plutonium per day. This work will enable the French Atomic Energy Commission to make final decisions on the large plutonium plant which will be associated with the two production graphite piles that are to be built in the Rhone Valley during the next few years. The work is part of a 15-year effort which, it is hoped, will eventually provide nuclear power for industry. Last year, over $100 million was appropriated for the first phase of this program, which includes the graphite piles. At present, France already has two experimental reactors: one is at Paris, the other is at Saclay.

GREAT BRITAIN- This country hopes to produce some 50,000-kw. of electrical energy from a natural uranium reactor at Calder Hall, Cumberland, and a full-scale breeder reactor. The Calder Hall reactor, which will be adjoining two plutonium-producing reactors at Sellafield, will use graphite as a moderator, and will be cooled by carbon dioxide circulating under pressure. The core is enclosed in a mild steel shell within the biological shield, while boilers are arranged around it and supply steam to a turboalternator plant of conventional design. Plutonium will be produced by the reactor as a by-product. The foundations of the project were laid last June, and it is estimated that construction will take two years. As to the full-scale breeder reactor, a suitable site has as yet to be selected. Meanwhile construction is underway on a low-power breeder reactor at Harwell, which is to provide nuclear data for the full-scale reactor. Also at Harwell, there is being built a natural uranium reactor moderated with heavy water which will produce a much more intense flow of neutrons than is presently available. It is estimated that this reactor will be completed in approximately 4-years; it will be used for research purposes, and will not generate power.

INDIA- Estimates here are that this nation's first nuclear reactor will be in operation within three years. While adequate funds have been supplied the Indian Atomic Energy Commission, location of the reactor has not yet been decided upon. Meanwhile, work on the first laboratory to use radioisotopes will start shortly in the Indian Agricultural Research Institute.

NORWAY- Operations of this country are through a joint effort with The Netherlands. The first reactor of the joint operation, which is 300-kw. in size, has been in operation almost two years at Kjeller. At the Kjeller Institute, where 82 people are employed, studies are underway to determine whether heavy water reactors are technically sound for power production reactors. Isotopes have been produced, however, on a limited scale, and are processed at the Institute for Nuclear Studies, Amsterdam; distribution is through Phillips-Roxanne Co.

SWEDEN- Completion is expected shortly of this country's first reactor; it is an experimental 100-kw. unit, using three to four tons of uranium, and moderated by heavy water. Operations are by A. B. Atomenergi, in which the government holds a 57% share, and fifteen private firms the balance. Location of this first reactor will be in Stockholm, in a special underground chamber blasted out of the bedrock on which the city stands.

SWITZERLAND- The present activity of the Swiss Atomic Energy Commission is concerned with planning a heavy-water, natural-uranium reactor, to be 10,000-kw. in capacity. It is estimated that the reactor will cost nearly $5 million, with one-quarter to be furnished by the Swiss Commission, and the balance to come from loans from industry or other sources. (Geneva will also be the site of the European Nuclear Research Center, a combined effort of 12-European countries to achieve research in nuclear physics impossible to the countries acting alone.)

RAW MATERIALS...radioactive minerals...

UNITED STATES- Cripple Creek, Colo.: Production of uranium ore near Uravan will be started by the Golden Cycle Corp. next month, an official of that firm has stated. To date, the work accomplished consists of a shaft which has been sunk to a depth of about 650-ft., with a station now being cut at that depth preparatory to mining operations. It was reported that a belt of uranium mineralization some 15-ft. in thickness was encountered in the shaft sinking operation.....Denver, Colo.: In a transaction reportedly in the million dollar bracket, the Four Corners Uranium Corp., headed by E. H. Sanders, Denver, has purchased 191 uranium claims in the Bull Canon area of Southwest Colorado from State Senator D. Lew Williams and associates, of Norwood. The claims include three operating uranium mines: the Jacknife, the Lookout, and the Mary Jane. The property is along the Montrose-San Miguel county line, near the Utah border.....A reorganization has now been made of the Consolidated Caribou Silver Mines, Inc., at Nederland, Colo., whose mining property reportedly contains uranium minerals, and which has been inactive for some months. The successor company is Nederland Mines, Inc., in which Donald M. Nelson, and a group of underwriters, have agreed to furnish some $150,000 for further development and to possibly block out silver and uranium ore.

CANADA- At the 14-claim property of Plum Uranium & Metal Mining, Ltd., in Lewis Twp., in the Blind River district, Northern Ontario, high radioactivity has been revealed by Geiger surveying, the company reports. The property adjoins to the west the holdings of Peach Uranium, the original uranium discovery in the Blind River district.....At Faraday Uranium Mines, near Bancroft, Eastern Ontario, about 13-miles northeast of Toronto, systematic diamond drilling for uranium has reportedly shown values of 0.129% uranium oxide equivalent (average) for a length of 320-ft., with an approximate width of 28-ft. The work is being financed and conducted by Pole Star Mines, which controls Faraday.....At the recently formed Thor Uranium Mines, work is planned on the 9-claim uranium prospect of this company, which is located in Southeastern Ontario, in Cardiff Twp., Halliburton Co., about 140-miles northeast of Toronto. To raise funds for work on this property, a stock offering is being made in the United States of some 600,000 shares of the firm.

AUSTRALIA- First production of refined uranium oxide in this country has been at the Radium Hill deposit, in South Australia, where a pilot plant operation has been the initial work. A large uranium plant is being shipped by the United States to Australia, as a result of the 10-year agreement which was signed early in 1953 in Washington, for combined development of the Rum Jungle deposit in the Northern Territory. Ores are now being stockpiled at Rum Jungle, awaiting facilities for treatment.

SOUTH AFRICA- With three uranium production plants now operating, and others about ready, uranium is proving a boon to the economy of this country. Much of the gold ore now being mined is of such low grade that the operation is marginal, when the uranium (which is found in the gold ores) is not a factor. However, extraction of the uranium--which indidentally is also of such low grade that it could not be mined economically by itself--makes the operation a money-making proposition. This is behind the processing plants, which will ultimately be at 17 gold mines, and the investment of some $100 million for their construction. (Extraction of the uranium involves several steps. After the gold has been extracted from the finely crushed ore, residue is conveyed to the uranium plant where it is mixed with dilute sulfuric acid and filtered. The solid residue from which the uranium has been extracted is then discharged into slime dams. The solution obtained in the filtration process must be subjected to further treatment before a pure uranium solution can be obtained. From this solution, uranium is precipitated and leaves the plant as a yellow mud. It then goes to a central calcining plant, where it is converted to a dry uranium oxide.)

Sincerely,

The Staff,
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